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GB A 2065350 EP A 0152839 EP A 0087143

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G4A  
H4T  
Selected US specifications from IPC sub-class  
G06F

(54) Point of sale terminals microcomputer system

(57) A point of sale microcomputer system includes at least one terminal 10 connected via a network to a controller, 50. Each terminal runs its own application program with a large primary file stored in a local RAM chip with a shared database being provided in the controller. Each terminal has a display, 12, a keyboard, 14, a microcomputer, 16, and a printer, 20. Optionally, a second display 18 is provided with each terminal, said second display being adapted for displaying customer information stored in a memory in the controller. The network includes a high speed communications board for providing high speed access to data files in the controller, and high speed transmit speeds in both directions between the controller and/or end terminal.

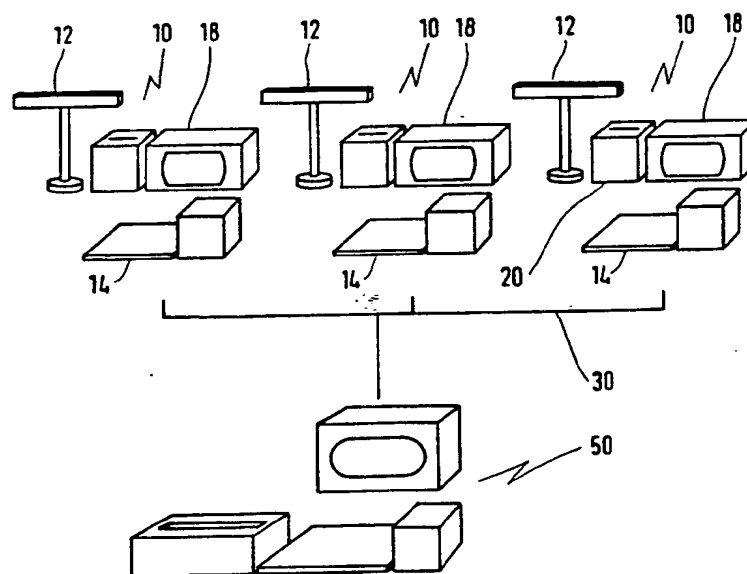
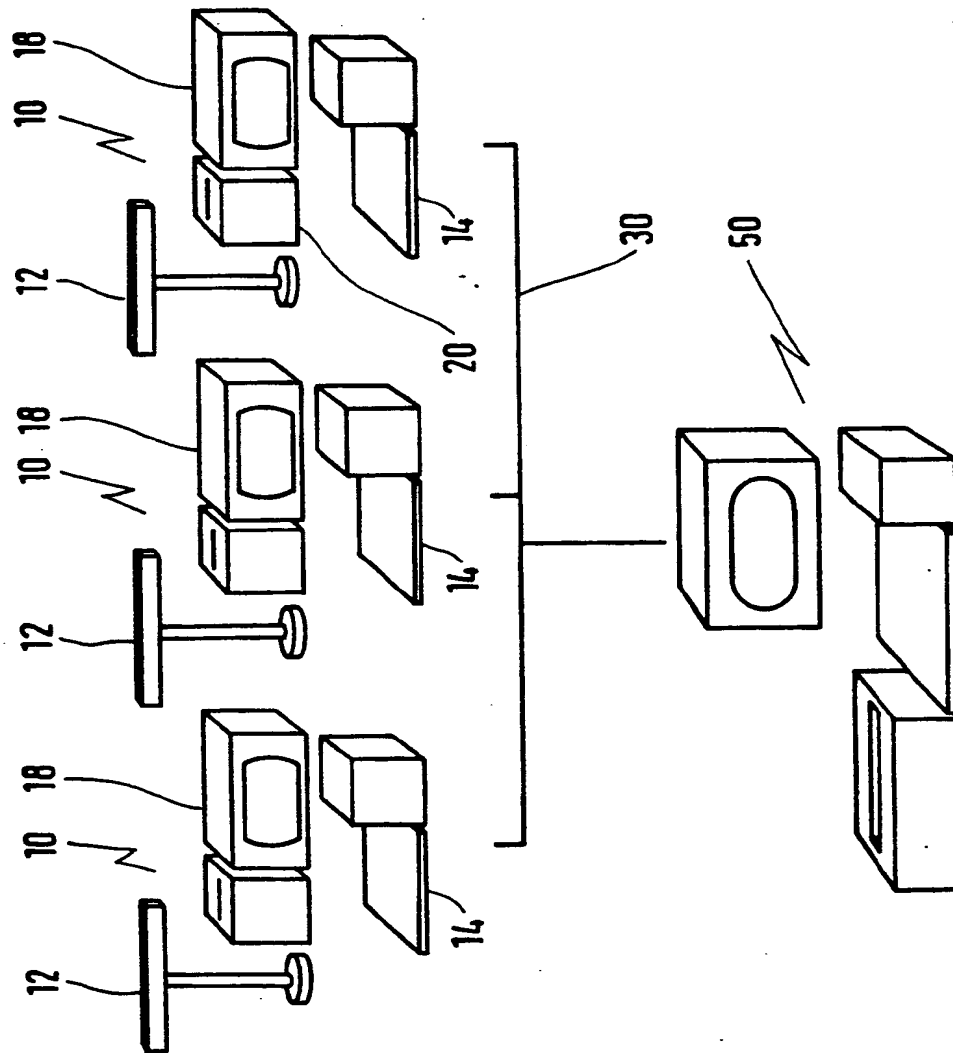
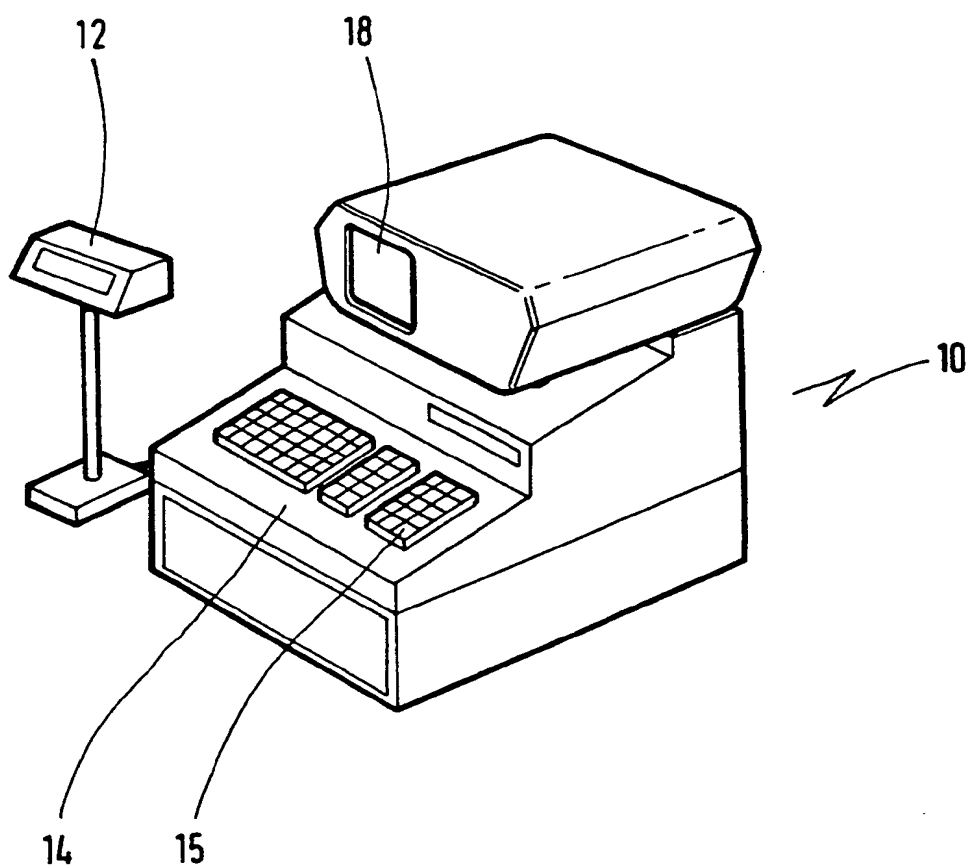
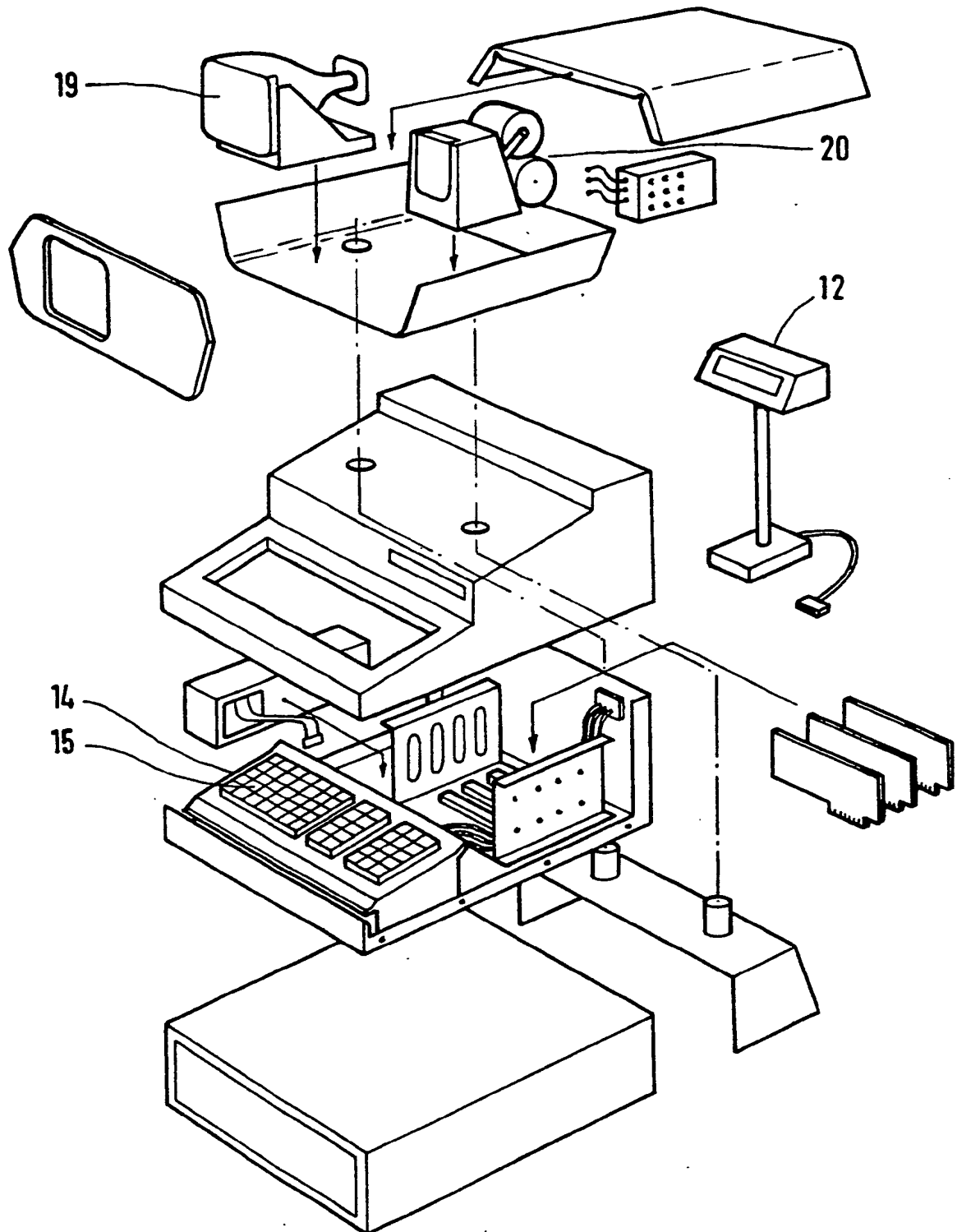


FIG. 1

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FIG. 1

FIG. 2

**FIG. 3**

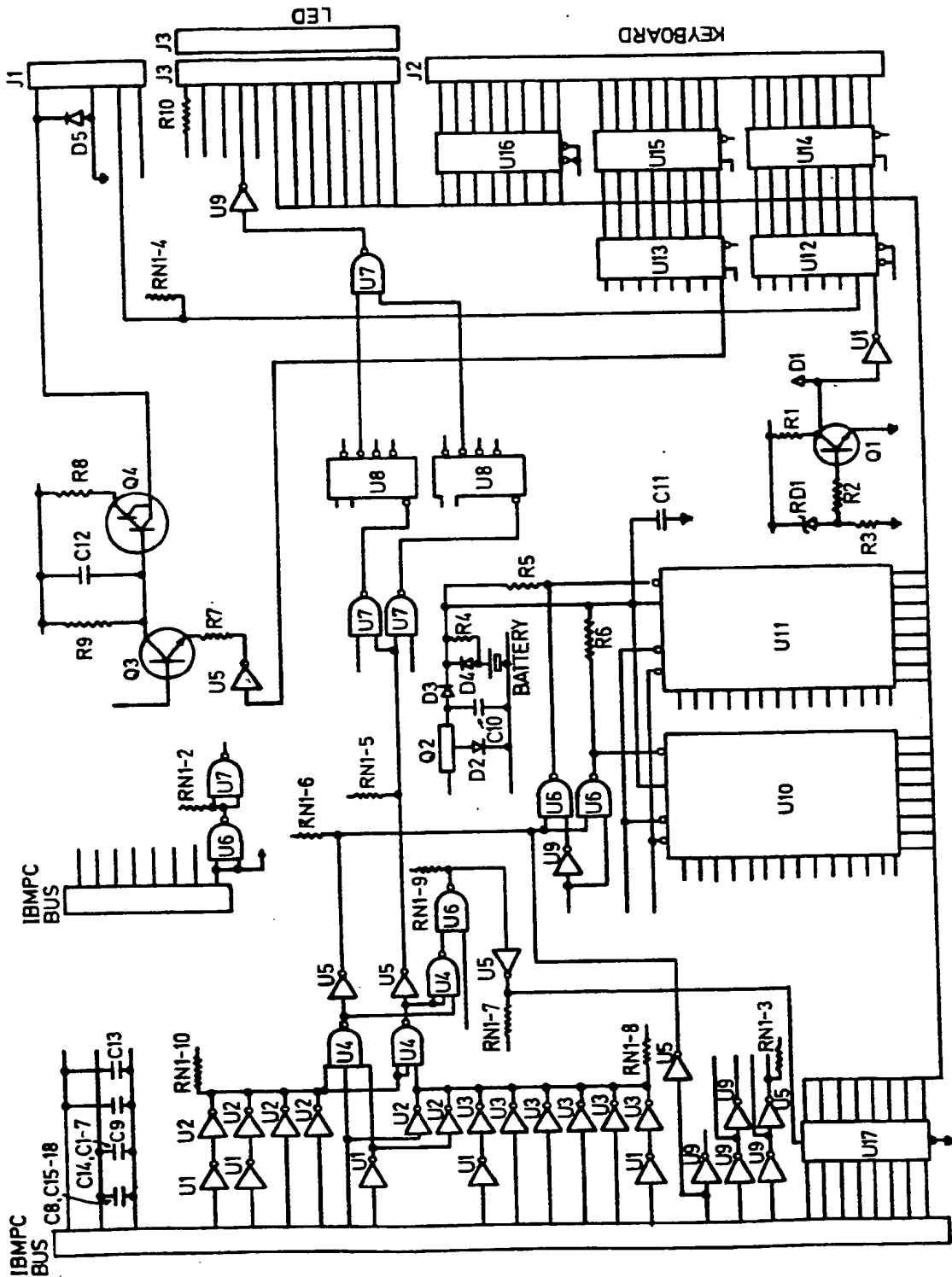


FIG. 4

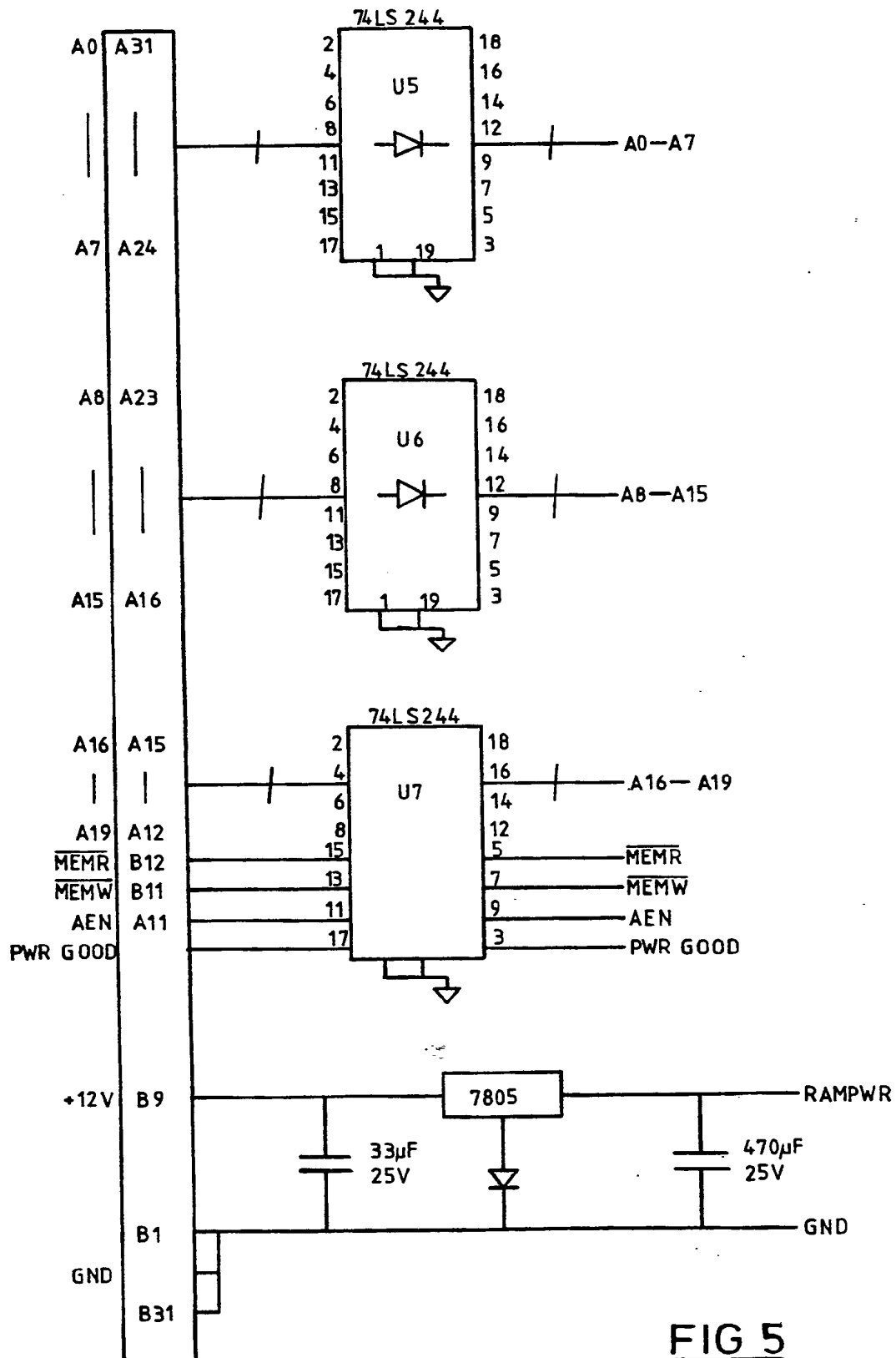


FIG 5

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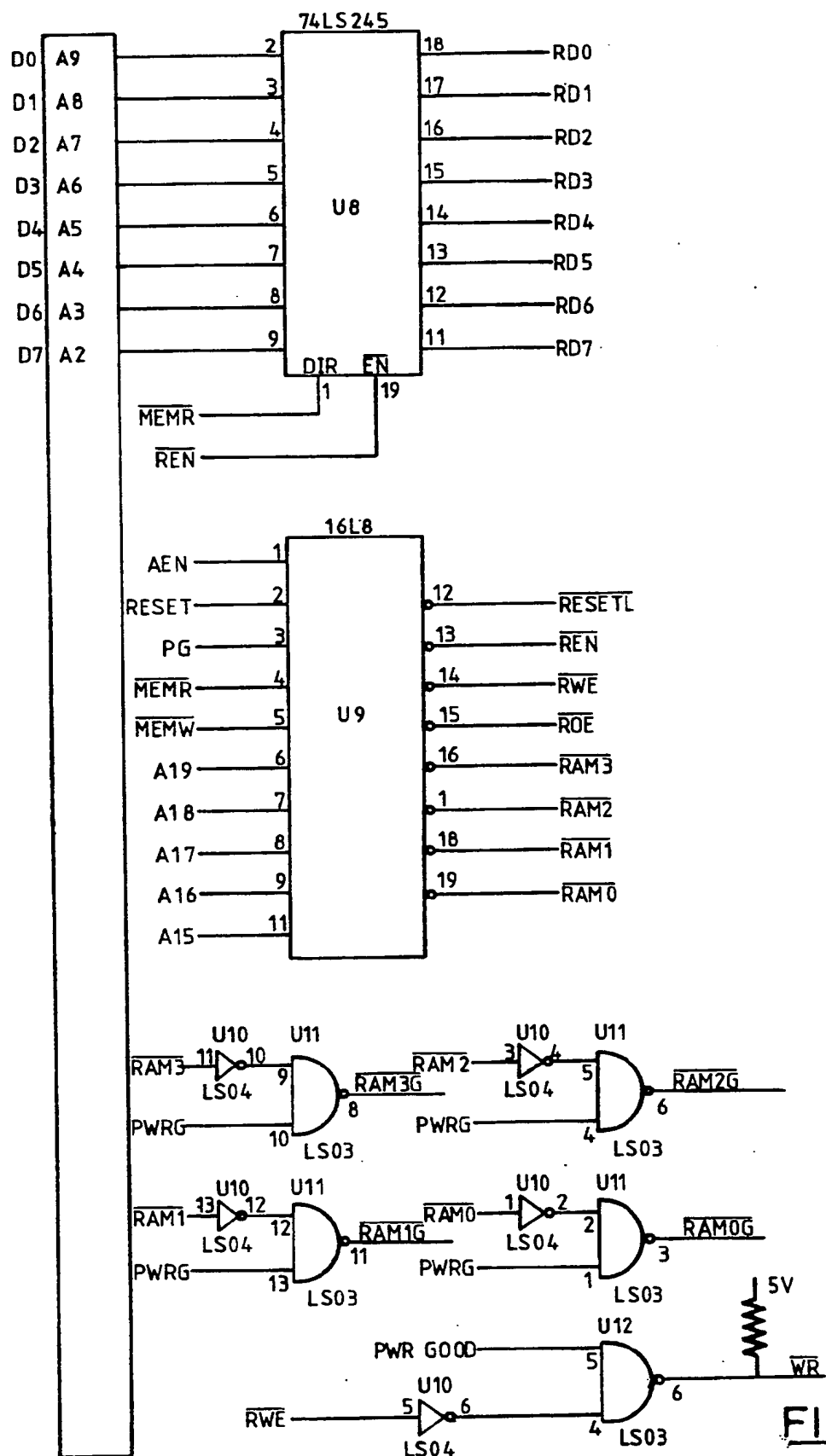


FIG 5a

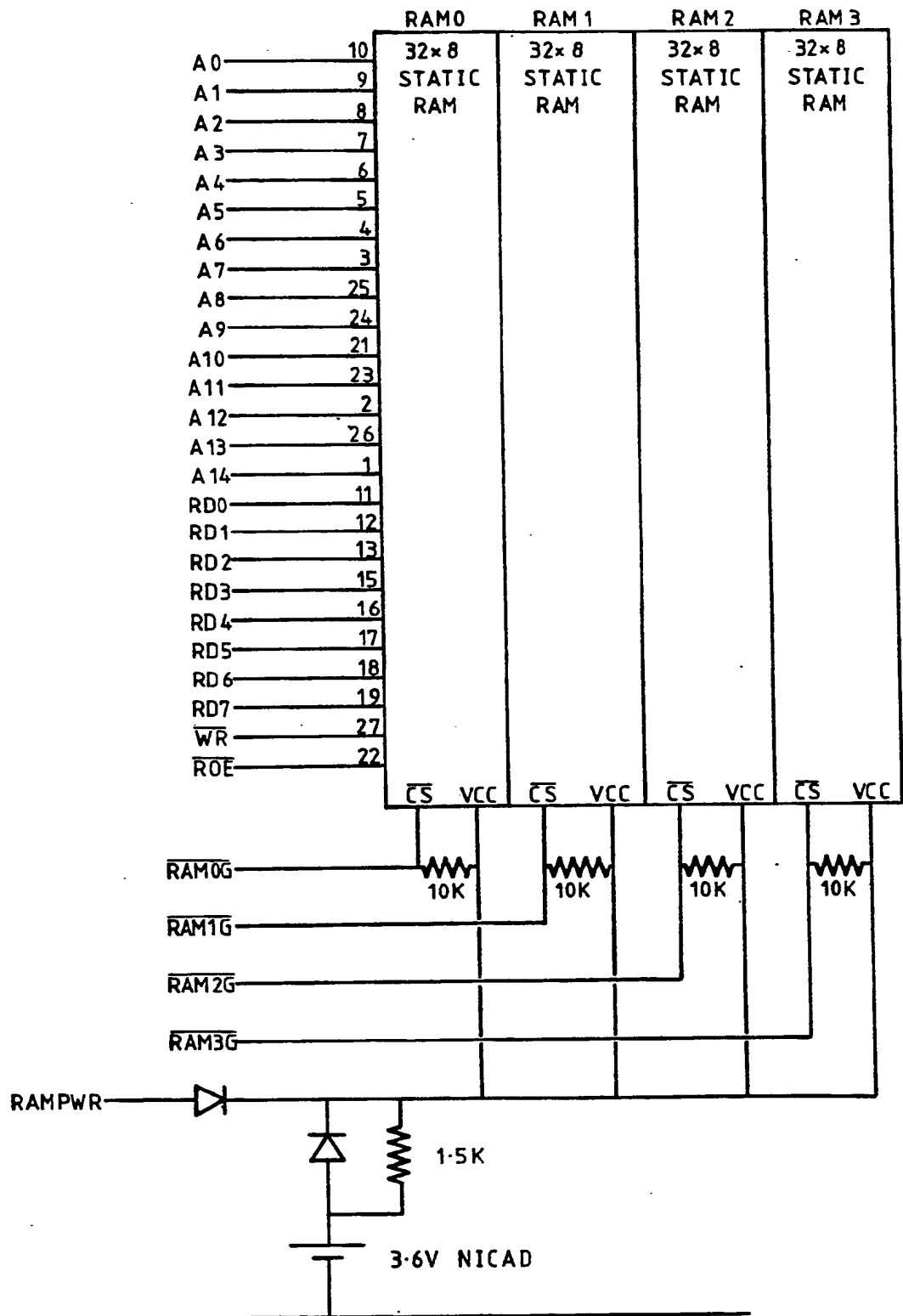


FIG 5b



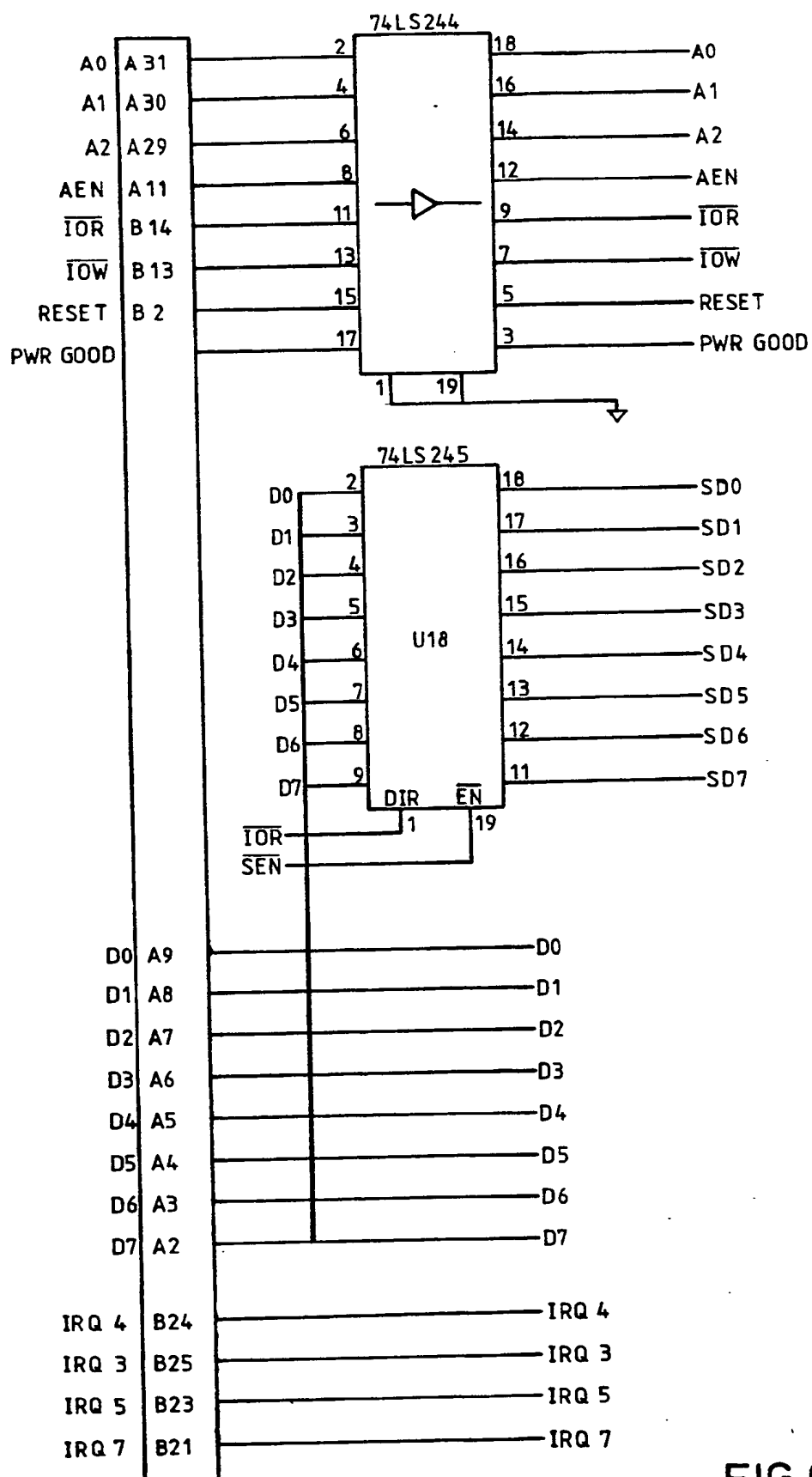


FIG 6

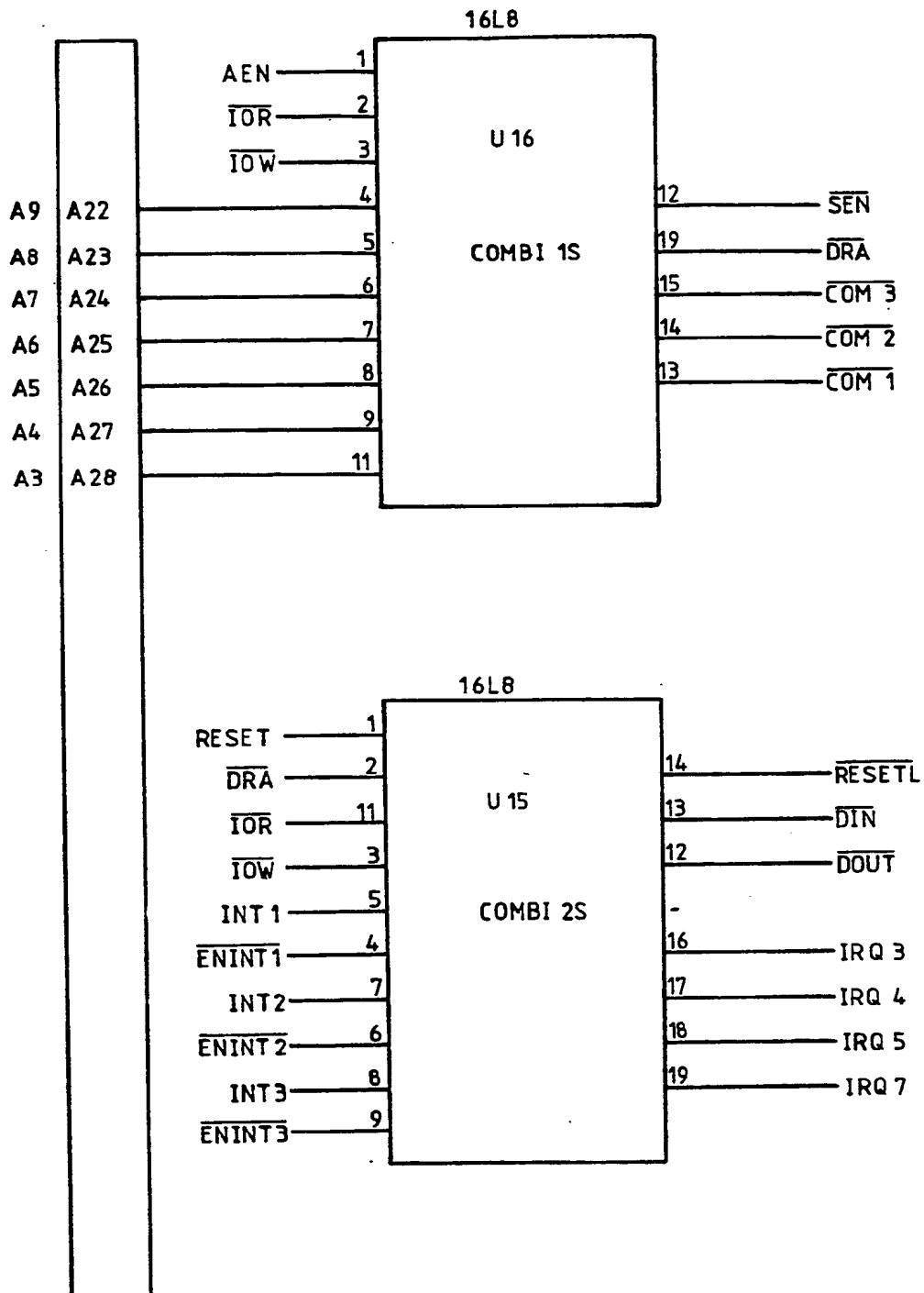


FIG 6a

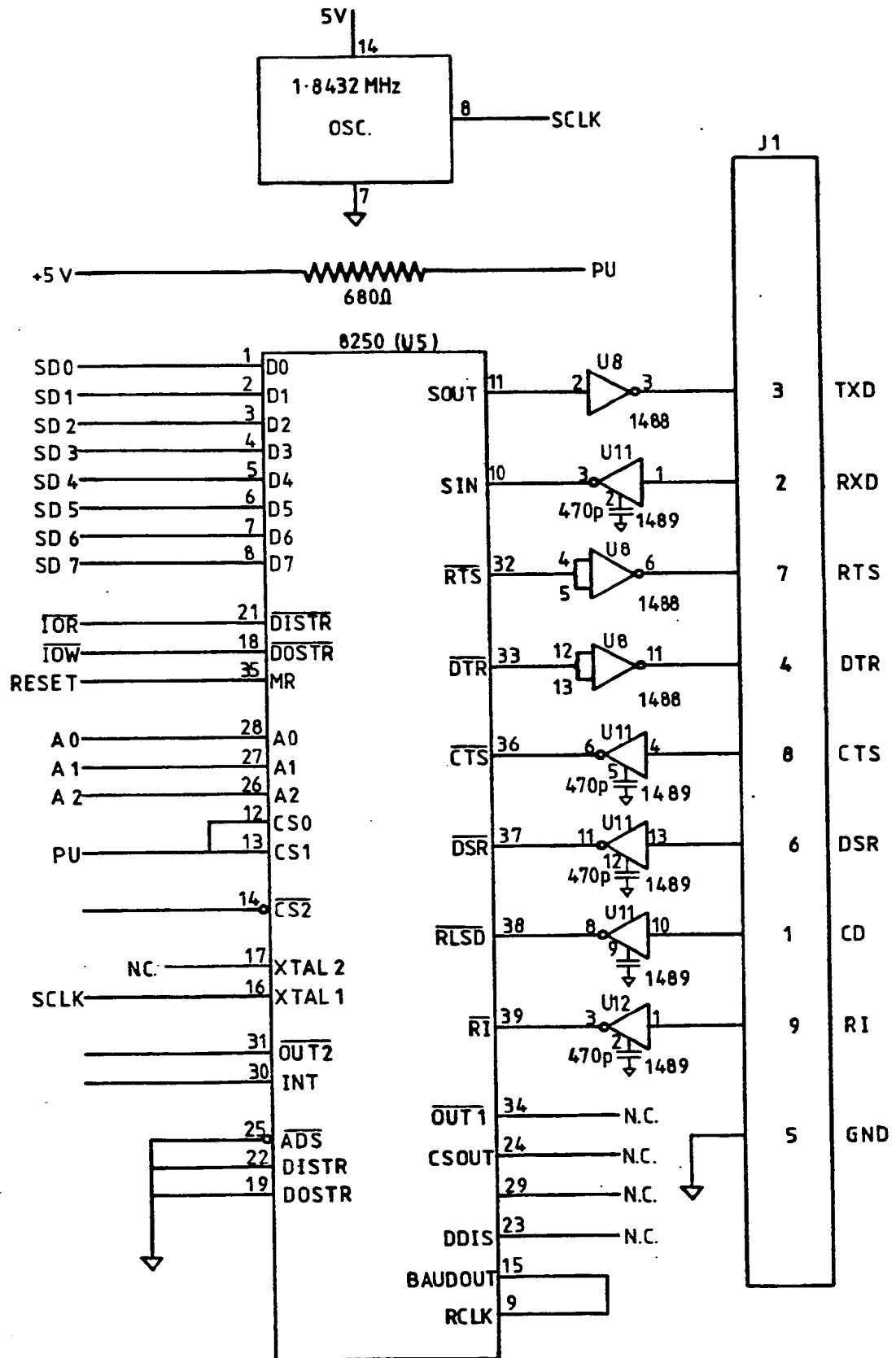


FIG 6b

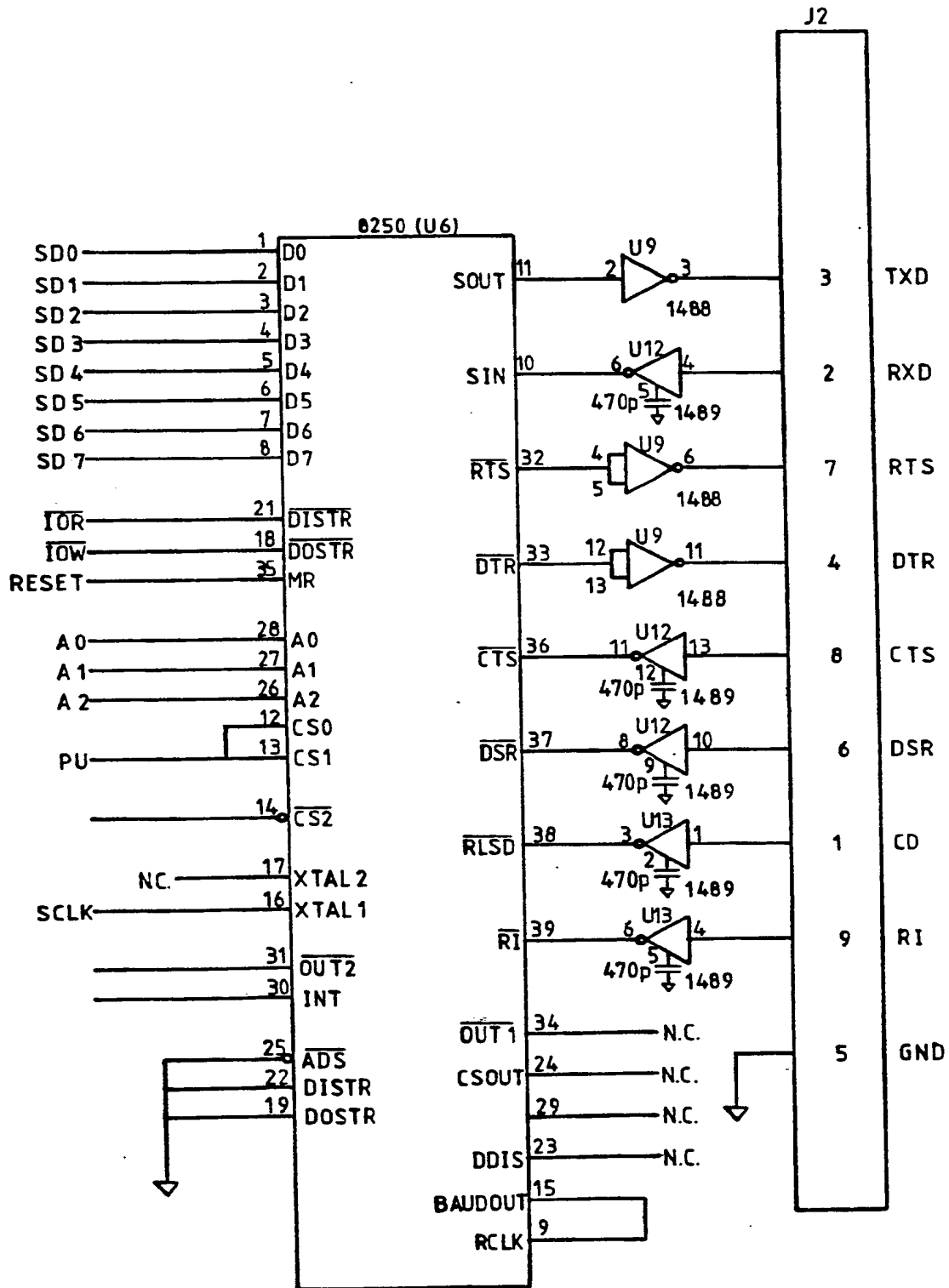


FIG 6c

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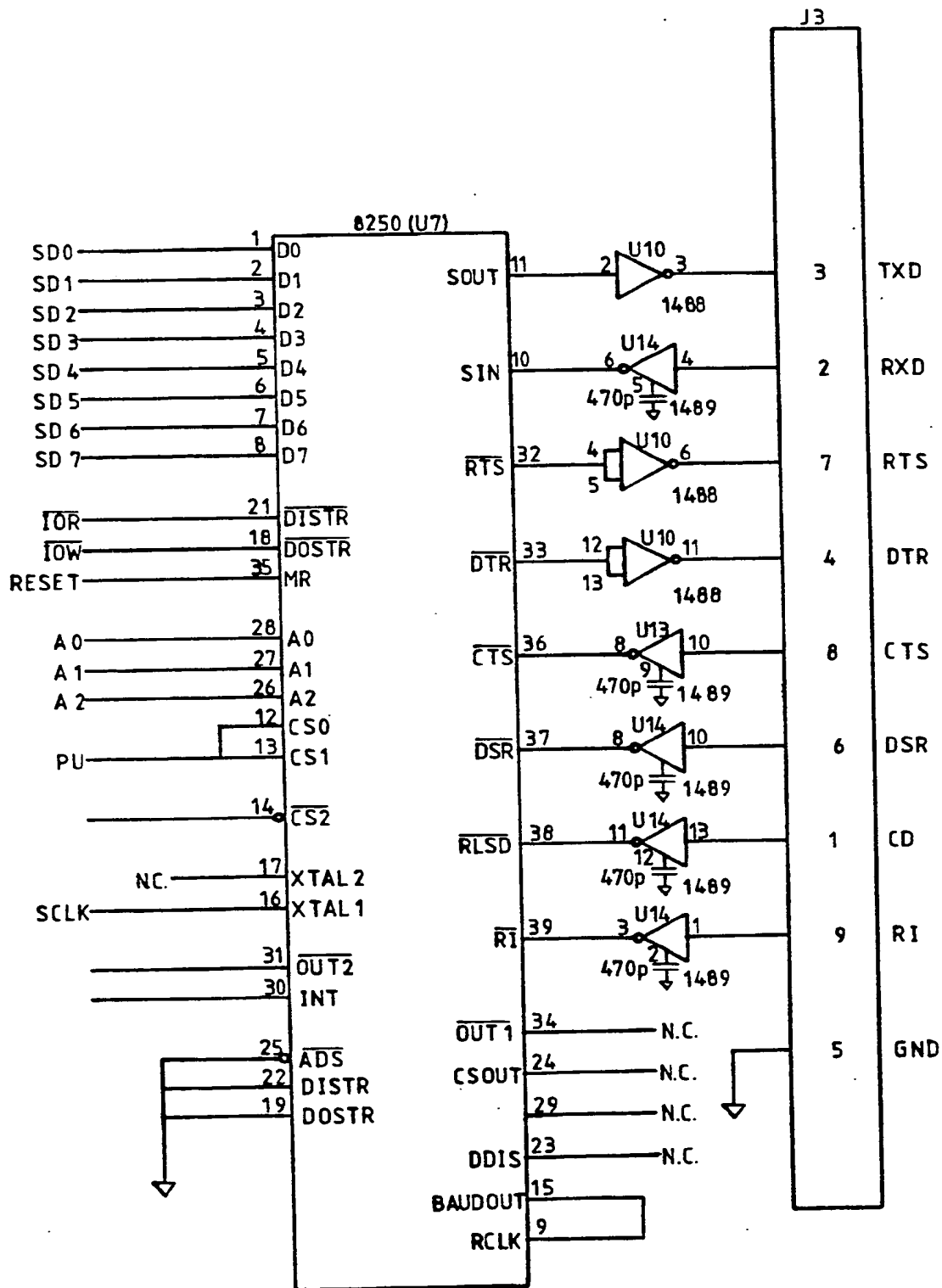


FIG 6d

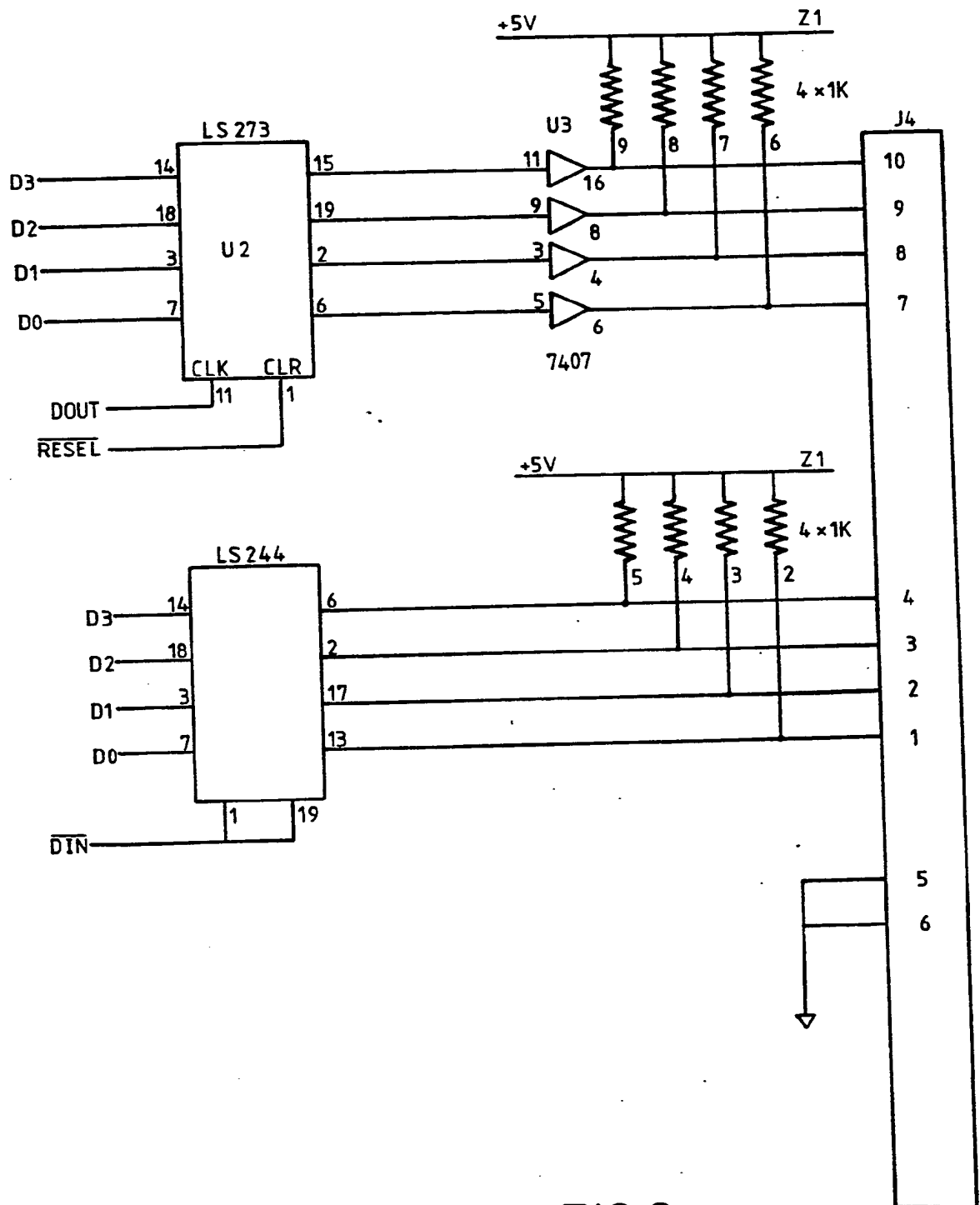
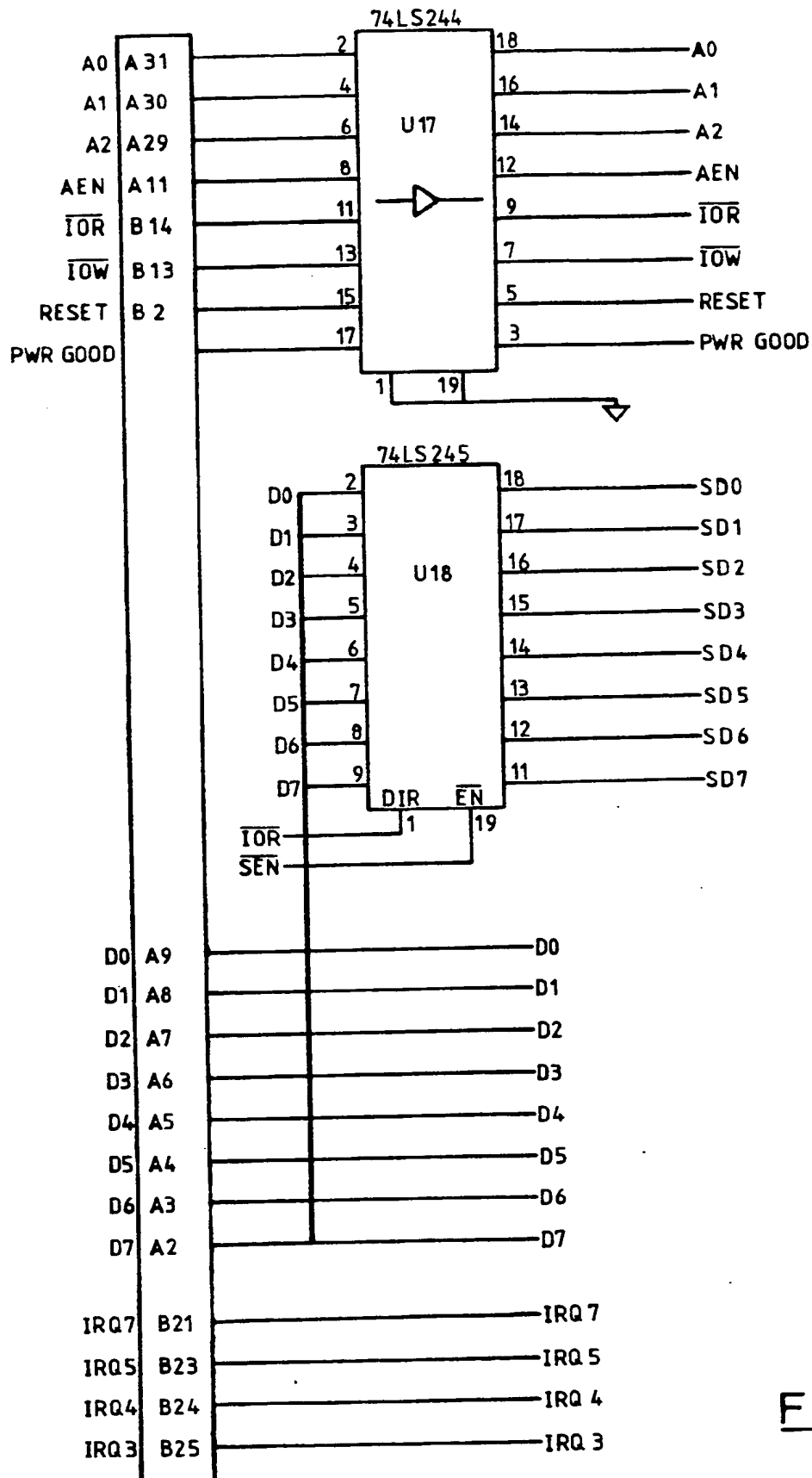


FIG 6e

FIG 7

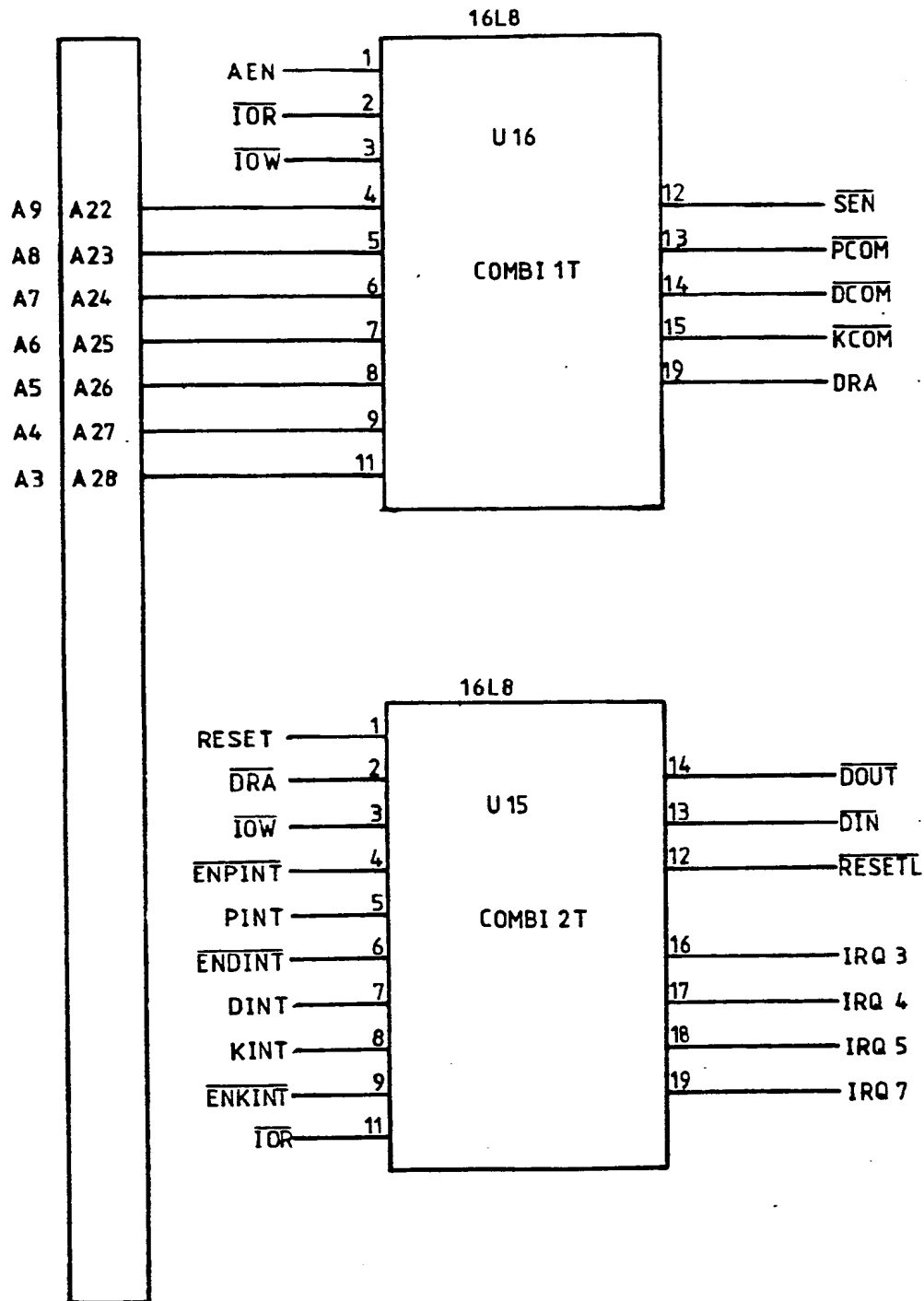


FIG 7a



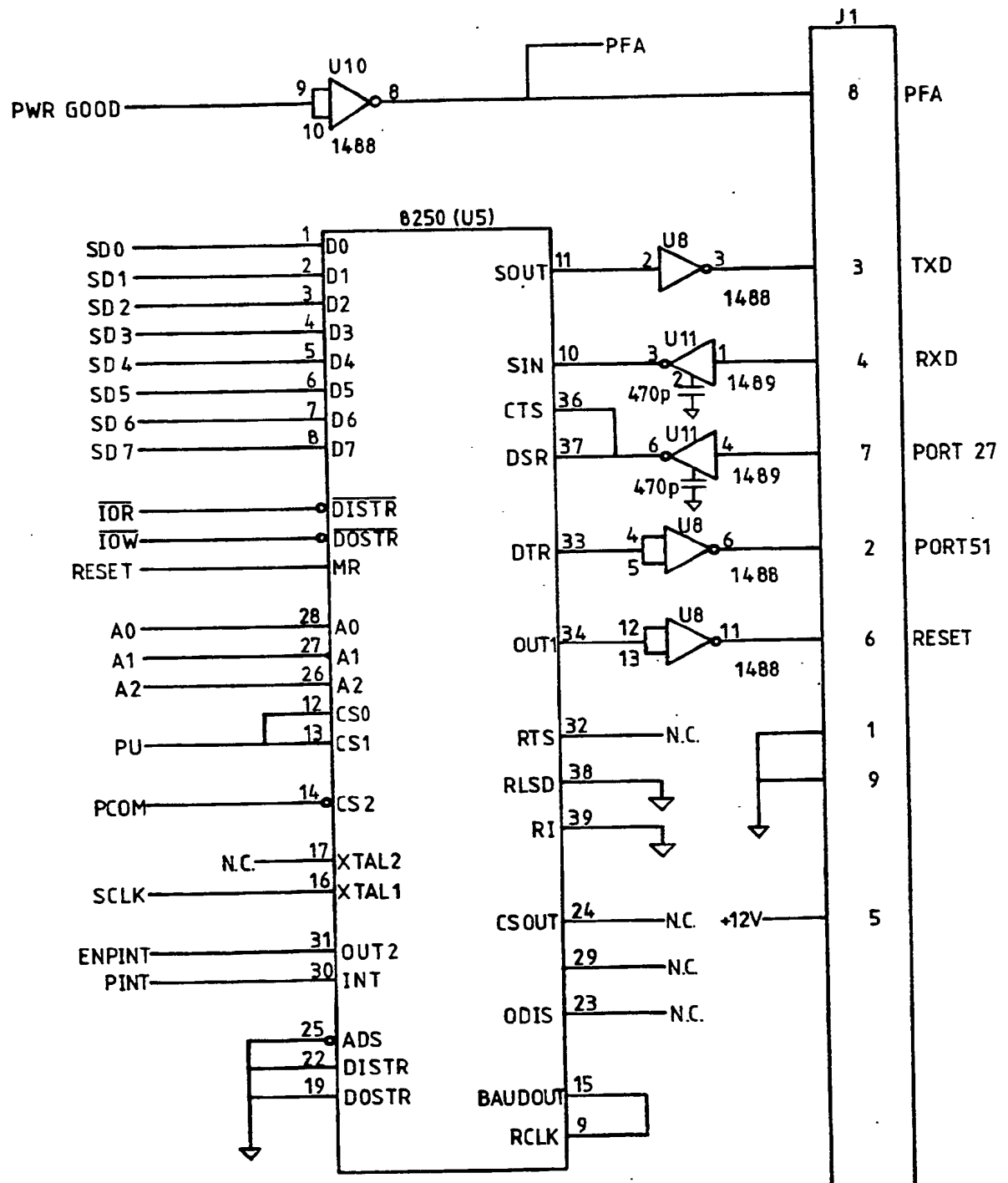


FIG 7b

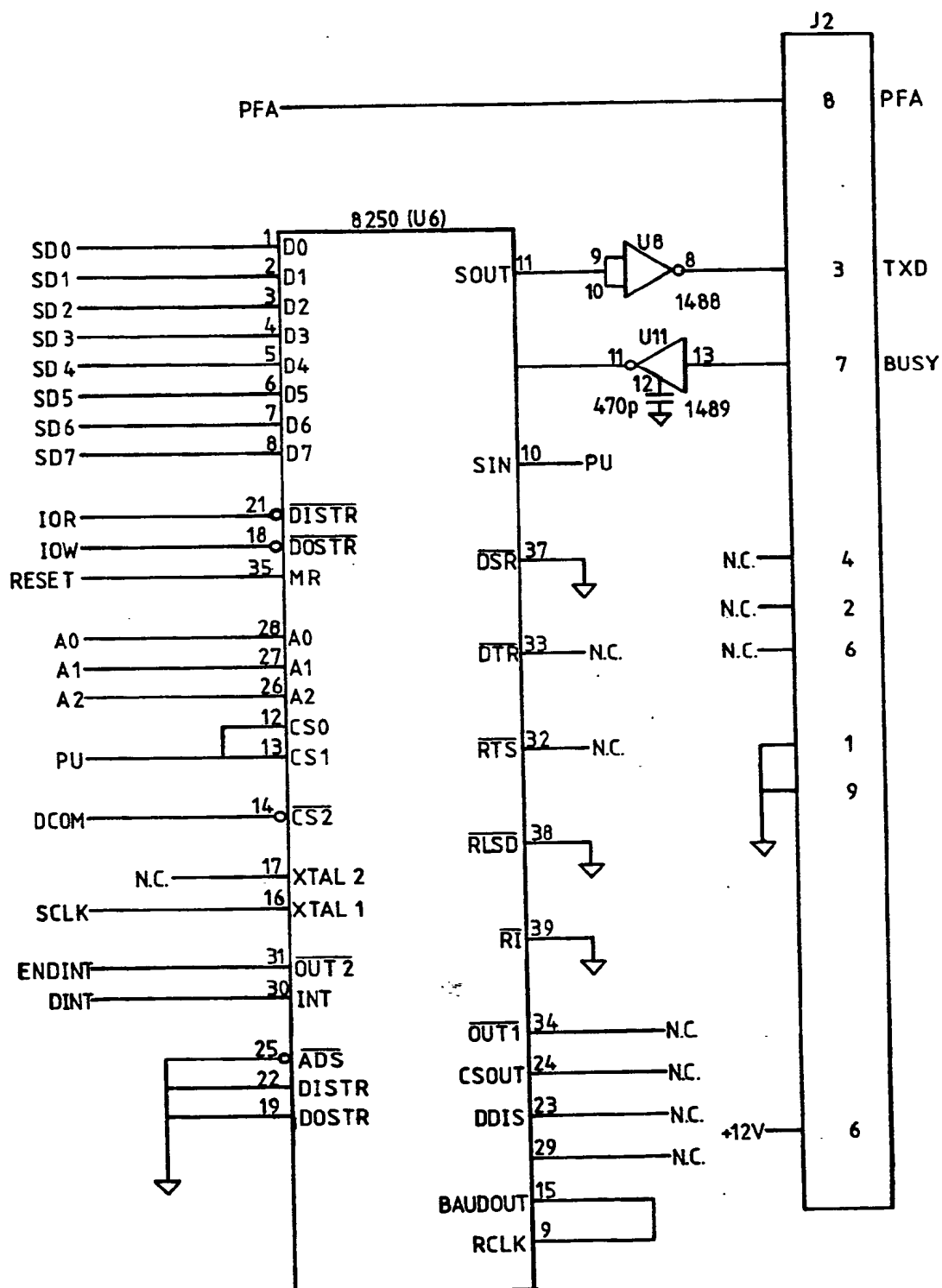
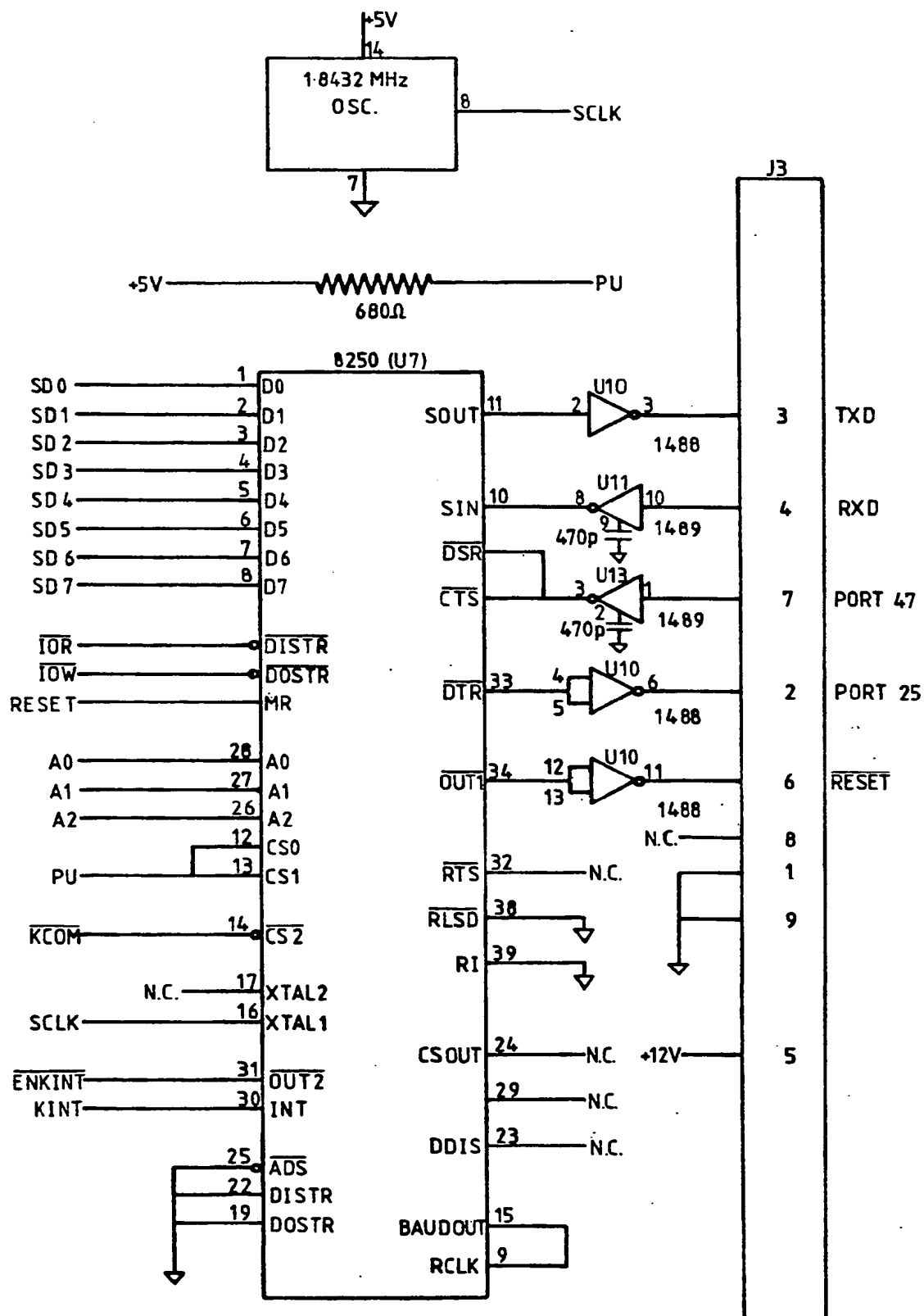


FIG 7c

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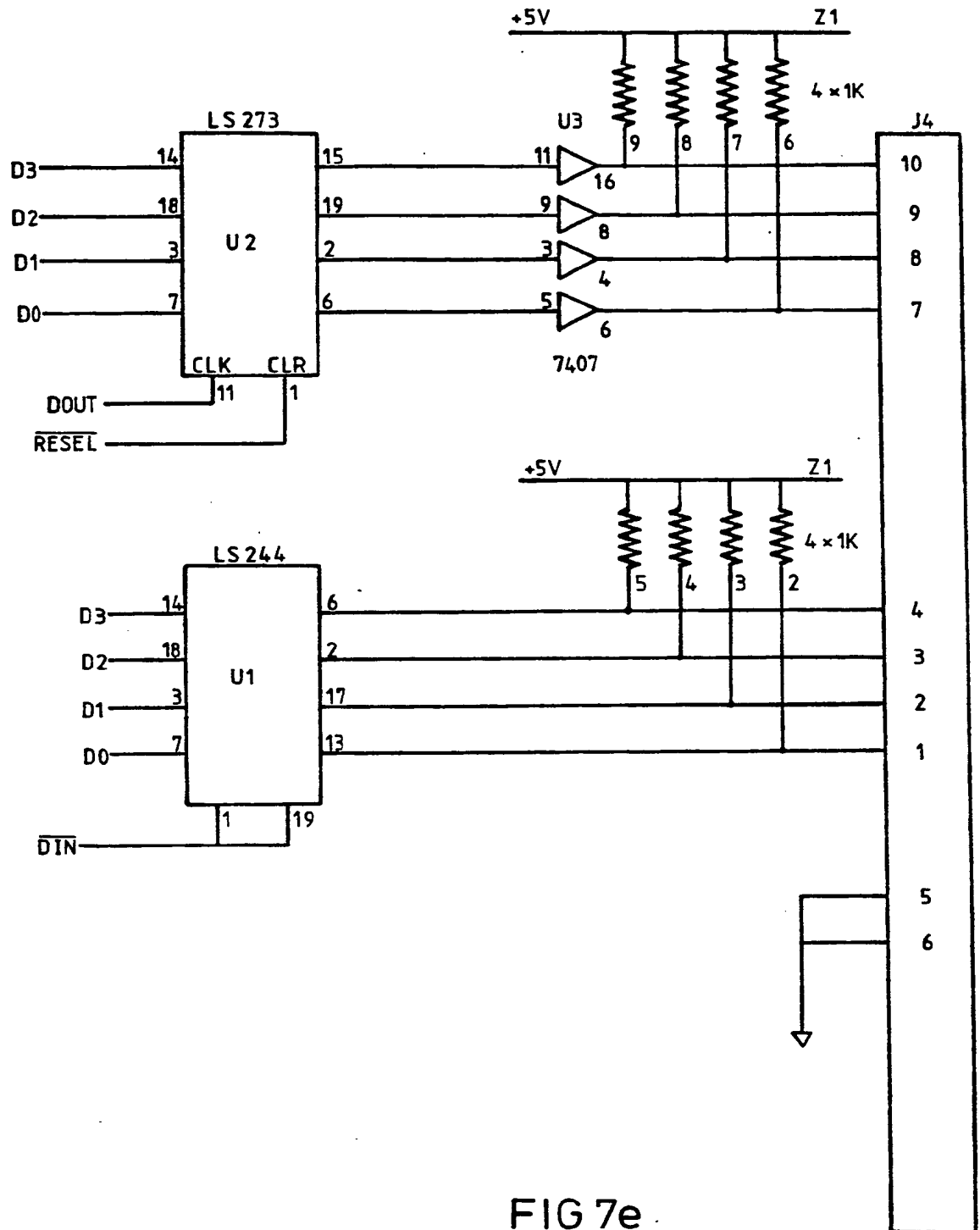


FIG 7e

IMPROVEMENTS RELATING TO POINT OF SALE MICROCOMPUTERS

The present invention relates to point of sale microcomputers.

The basic requirements of all point of sale microcomputers, irrespective of the retail application are as follows:

1. Data capture and storage
2. Date processing
3. Data retrieval and display as output
- 10 4. Full multi-user capability

The invention is based on intelligent, fully programmable personal computers configured as point of sale terminals networked to a controller personal computer.

The invention provides a point  
15 of sale microcomputer system comprising  
at least one terminal connected via a network to a controller, each terminal running its own application program with a large primary file stored in a local RAM chip, with a shared database being provided in the  
20 controller, each terminal having a display, a keyboard, a microcomputer and a printer.

Preferably, a second display is provided with each terminal, said second display being adapted for displaying customer information stored in a memory in the controller.

The network may include a high speed communications board for providing high speed access to data files in the controller, and high speed transmit speeds in both directions between the controller and/or end terminal.

5       The invention will hereinafter be more particularly described with reference to the accompanying drawings, which illustrate by way of example only, one embodiment according to the invention. In the drawings:       Figure 1 is a schematic representation of a total system  
10 according to the invention;

Figure 2 is a perspective view of a point of sale terminal according to the invention;

Figure 3 is an exploded perspective view of the point of sale terminal shown in Figure 2;

15       Figure 4 is a schematic representation of the layout of the interface cards for use in connecting the microcomputer of the point of sale terminal to the keyboard, customer display, cash drawer and CMOS RAM microchip.

20       Figures 5 to 5B is a schematic layout of a CMOS card used in the system of the invention.

Figure 6 to 6E is a schematic layout of an input/output drivers card; and

25       Figures 7 to 7E is a schematic layout of a TEC peripherals input/output drivers card.

Referring to the drawings, and initially to Figure 1, the system is based on intelligent terminals 10 running their own applications programs with a large primary item file (main sellers) held in a local RAM microchip and a network connection 30 to a shared database in a controller terminal 50 for file enquiries, record updates, program loading etc. The RAM configuration of the terminals 10 of between 64K to 512K is based on holding the item file for over 90% of the terminal throughput. In the majority of applications 90% of all throughput comes from 35% of the items sold. Such a configuration gives a high level of terminal independence and reduces the traffic on the communications line allowing a large number of point of sale terminals in each installation without affecting performance. The effective tuning of the system by the mix of fast local processing, reduced communications line traffic and reduction of

controller activity for servicing requests allows main frame performance using microcomputers.

This system tuning philosophy restricts communications line activity to

- 5           1. Enquire for price and description for items not held in the primary buffer
2. Credit card and negative check enquiries
3. Account and second updates
4. Transaction dumping from point of sale
- 10 terminals to controller terminal
5. Program loading
6. Broadcast from the controller terminal to the point of sale terminals.

Each point of sales terminal 10 comprises a light  
15 emitting diode display 12, a keyboard 14, a microcomputer 16, a screen 18 and a printer 20.

Each Point of Sale (POS) terminal has its own (optional) light emitting diode (LED) display 12 for the customer's benefit. It displays the customer  
20 sales information (price of an item, subtotal and change).

Additional use is made of the LED 12 to display.. information - "closing early today"



advertising - "special offer on six packs in  
the off licence",  
and seasonal messages - "happy christmas to all  
our customers" (or any message that the user  
wishes to display).

The user first of all enters the message(s)  
into the controller 50 where they are stored until  
they are needed. At each POS terminal the user can....

select one of the messages to be displayed or  
stop the current message from being displayed.

The main task of the LED 12 is to display  
sales information and this job will always come first.  
However, if a predefined period of time has elapsed  
since the LED 12 was last used (say 2 minutes) the  
POS unit 10 automatically starts to display the select  
message on the 20 character LED. The message is  
scrolled from right to left so that the message can  
be longer than the 20 characters displayed at any one  
time. The message is repeated until it has to be used  
to display more customer sales information or until  
the user cancels the message.

It is possible to use the POS unit 10 and at  
the same time have a message scrolling on the LED 12  
so long as the current operation doesn't require the  
use of the LED.

The keyboard 14 has one hundred and twenty keys  
which are programmable by the user. The keys are  
of the long life type and are dust and moisture proof

The microcomputer 16 is based on an 8088 central processing unit and is the processor that has been used in the majority of IBM (Trade Mark) personal computers available to date. Alternatively, an 8086  
5 type cenral processing unit could be used. The amount of RAM in both the controller and tills can be configured to match the exact requirements of each site up to 640K, i.e. 16,000 sales items per location.

The display 18 is an 80 column by 25 line, 225mm  
10 monochrome screen 19 which allows a user friendly display of data, keyed, running subtotals, full error displays, detailed prompts and display of menu bits included whilst displaying order entry. Also the screen has the facility to underline, reverse  
15 highlight and blink the actual display on the screen.

The printer 20 which is an optional feature used in printing customer receipts is an EPSON (Trade Mark) Model 522 standard printer for heavy duty point of sale applications.

20 Located under point of sale terminal 10 is a cash drawer 35 which is released by the central processing unit at the termination of a transaction or when specifically released by the user.

Included among the interface cards 36 are  
25 interface cards for use in connecting the micro-

computer to the keyboard, the customer display, cash drawer and CMOS RAM microchip (U10 and U11). The circuit arrangement for these cards is shown in Figure 4.

A communications board is provided which gives  
5 high speed access to all data files in the controller  
50 and which gives access to all data files in the controller and which gives high speed transmit facilities to transmit all sales data to the controller. Thus only one centred source of pricing files, i.e.  
10 only one copy of pricing information need be held at the controller and all terminals can extract relevant information from that single source at any time and at very high speed. Equally, the controller can transmit information to the terminals or an individual terminal  
15 as required and at high speed. Such an arrangement avoids copying diskettes and the need to maintain different copies of diskettes for different terminals.

The CMOS RAM in each point of sale terminal holds all sales information and other critical control  
20 information in the event of power failure and any communications difficulties between the point of sale terminal and the controller, for example, if the controller is inactive or under a very heavy load in a large system. The buffer sizes in CMOS can cater  
25 indefinitely for locations with up to 1500 individual sales.

Additional CMOS can be installed up to 16  
Megabytes to simulate a disk drive to appear  
exactly as a disk drive to the software,  
providing extremely high performance and retain data  
5 in the event of power loss.

The communication system between the point of  
sale terminals 10 and the controller 50 is based on a  
KEYNET (Trade Mark) communicating system. Such a  
system gives high transmission rates with a high  
10 throughput low error rate. Each mode is able to  
communicate with all others. Installation is very  
easy using four twisted pair cables. The system  
is very flexible and units can be added or taken out  
easily.

15 The controller terminal 50 includes a keyboard  
54, a microcomputer 56, a display 58 and a printer 60  
which is a 80 column printer for reporting progress  
condensed characters are used for producing detailed  
reports.

20 Many tables are included in the system, i.e.  
system parameters, key parameters, unit parameters,  
cashier parameters, group parameters, size/measure  
table, recipe parameters etc. to allow flexibility,  
however, a considerable program has been written in  
25 "C" language to provide a high performance throughput  
at the point of sale terminal. The system will  
process and display from start of order to finish 11  
items in 5 seconds without printing a receipt

and 6.5 seconds with printing a receipt.

The contents of all files can be optionally encoded which would be of value when transmitting information over the telephone lines or to protect  
5 information on site from unauthorised adjustment. Information from all files can be extracted easily in any language, be pre-processed and transmitted to central control in scrambled form if required.

CLAIMS:

1. A point of sale microcomputer system comprising at least one terminal connected via a network to a controller, each terminal running its own application  
5 program with a large primary file stored in a local RAM chip, with a shared database being provided in the controller, each terminal having a display, a keyboard, a microcomputer and a printer.
2. A point of sale microcomputer system as claimed in  
10 Claim 1 in which a second display is provided with each terminal, said second display being adapted for displaying customer information stored in a memory in the controller.
3. A point of sale microcomputer system as claimed in either Claim 1 or Claim 2 in which the network includes a  
15 high speed communications board for providing high speed access to data files in the controller, and high speed transmit speeds in both directions between the controller and/or end terminal.
4. A point of sale microcomputer system substantially  
20 as herein described with reference to and as shown in the accompanying drawings.